U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
PB80-146103

EPA and the Academic Community Partners in Research Solicitation for Grant Proposals

(U.S.) Environmental Protection Agency, Washington, DC

Jan 80

BIBLIOGRAPHIC INFORMATION

PB80-146103

EPA and the Academic Community. Partners in Research: Solicitation for Grant Proposals.

Jan 80

PERFORMER: Environmental Protection Agency, Washington, DC. Office of Research and Development. EPA-600/8-80-010

See also report dated Dec 79, PB80-133564.

The Office of Research and Development (ORD) currently provides assistance for mission related research and development projects through headquarters and 15 major laboratories located throughout the United States. ORD uses the Grant mechanism to accomplish its objectives and priorities in response to the overall mission and priorities of EPA and is highly concerned with solving specific priority problems rather than only advancing basic scientific knowledge. However, exploratory research as a basis for anticipating new problems and providing a sound basis for regulatory decisions is emphasized.

KEYWORDS: *Research management, *Universities, *Environmental Protection Agency.

Available from the National Technical Information Service, Springfield, Va. 22161

PRICE CODE: PC A02/MF A01

United States
Environmental Protection
Agency

EPA-600/8-80-010
January 1980

PB80-146103

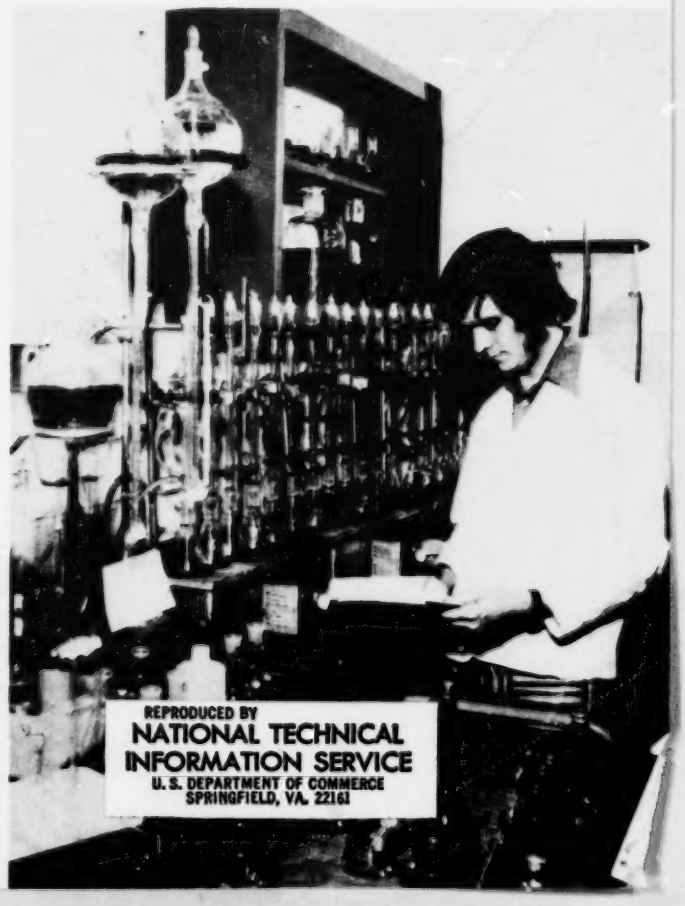
Research and Development

EPA

EPA and the Academic Community

Partners in Research

Solicitation for Grant Proposals



REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

Solicitation for Grant Proposals

Introduction

The Office of Research and Development (ORD) currently provides assistance for mission related research and development projects through headquarters and 15 major laboratories located throughout the United States. ORD's research objectives are contained in the annual *Program Guide*. The *Program Guide* is an official EPA publication describing ORD's research interests and available funds. The *Guide* contains specific information detailing application procedures and Agency contacts and may be obtained from:

Center for Environmental Research Information
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

Awards may take three forms: contracts, grants, or cooperative agreements. Each instrument serves a different purpose. Proposals for cooperative agreements in the areas outlined below should be directed to the appropriate laboratory for action, either in the form of a pre-proposal or after discussion with laboratory personnel.

Grant proposals cannot be discussed in advance, nor can pre-proposals be accepted. Contact Grants Administration Division (GAD), USEPA, 401 M Street, S.W., Washington, D.C. 20460, for application procedures and forms which must be returned to GAD by the appropriate date. GAD will conduct a preliminary administrative and legal review before routing the proposal for Peer Review.

ORD uses the Grant mechanism to accomplish its objectives and priorities in response to the overall mission and priorities of EPA and is highly concerned with solving specific priority problems rather than only advancing basic scientific knowledge. However, exploratory research as a basis for anticipating new problems and providing a sound basis for regulatory decisions is emphasized. Relevance and scientific merit of proposals will be significant factors in the evaluation procedures since all projects are directed at meeting specified objectives as determined by the Agency's budget.

With this announcement, ORD is implementing its new policy for solicitation, review, and award of research grants and cooperative agreements as stated in 40 CFR Part 40 FR44 #193 (FRL 1332-5) and the FY80 ORD *Program Guide*. Note that grant eligibility is restricted by law and that the specific acts cited in the *Program Guide* should be consulted in case of doubt.

ORD desires (1) to encourage applications from an increased number of experienced researchers, especially those who have not previously received EPA extramural research funding assistance, including handicapped, minority, and female researchers, (2) to improve the scientific quality of its program, and (3) to assure the relevancy of the grant program to the EPA mission.

Proposals will be evaluated by the appropriate Peer Review Panel, convened at regular intervals. The Panel will be primarily composed of non-EPA scientists acknowledged as experts in their respective fields. Although applications may be submitted at any time, there will be a cut-off date for each session. The FY80 dates are March 30 and June 30. Results will, generally, be announced within 60 days of the Panel meeting. If, for any reason, a decision cannot be reached within the 60 days, the proposer will be notified as to the status of the grant request. Proposals received after June 30 will not be considered until fiscal year 1981. Although this solicitation emphasizes the need for research in a particular area, proposals may be submitted in any area which the proposer feels is relevant to any aspect of the overall program as detailed in the *Program Guide*.

Pollution Control Processes

ORD produces scientific data and technical tools supporting adequate environmental standards for national pollution control. ORD's pollution control technology programs for industrial, municipal, and energy processes reflect Agency research activities emphasizing multimedia pollution control approaches. The objective of this segment of the grant program is to supplement ORD activities by stimulating scientific and technical research fundamental to pollution control advances. For example, current priority concerns include:

1. Generic unit process pollutant modeling for the chemical industry needed to enable EPA's utilization of the generic unit process pollutant model for specific discharge evaluations and generic regulations. Process conditions (i.e., temperature, pressure), reaction rate and order, reaction driving force, size of process unit and other variables must

be evaluated to determine how, and to what extent, they influence the validity of generic pollutant discharges from generic unit processes. Research efforts are also needed to set scientific and technical bases for predicting pollutant discharges for specific chemical industry manufacturing processes based on generic pollutant discharge findings for the associated generic unit processes.

2. The assessment of fuels, combustion conditions, and combustion equipment to identify and verify techniques that can be used to reduce the formation and subsequent emission of polycyclic organic materials, and other complex and hazardous pollutants and carcinogens.

   Program elements of research beyond those already in progress elsewhere may include but are not limited to:

   (a) Fuel analysis identifying potentially mutagenic and carcinogenic fractions likely to produce such compounds during processing or combustion.

   (b) Evaluation of fuel processing and combustion, identifying rates of formation and release of pollutants.

   (c) Development of techniques to separate identified mutagenic fractions from fuels prior to processing or combustion or to assure destruction of these materials during processing or combustion.

   (d) Fuel processing and/or combustion modification development to reduce or minimize the formation and/or emission of pollutants.

3. Determination and assessment of basic reaction kinetics and mechanisms for toxic pollutant generation and destruction by class or group. Apply resulting information to advanced technologies to prevent the formation of pollutants and hazardous discharges.

For further information of a procedural nature please contact:

Donald F. Carey
U.S. Environmental Protection Agency
RD-675
401 M Street, S.W.
Washington, D.C. 20460
(202) 426-2355

Health Research

The objective of the health research program is to obtain and provide a scientific basis upon which the Agency can make regulatory decisions concerning the protection of human health from environmental pollutants. The principal concern is to determine whether, or to what extent, exposure to various pollutants contribute to environmentally related health problems. Research is conducted utilizing studies of acute and chronic animal toxicology, controlled human exposure, and epidemiology.

For fiscal year 1980, the following areas are being emphasized for grant support:

1. Epidemiologic studies of persons exposed to pollutants in air and water media. Included is the land application of waste water and sludge, light duty diesel engine emissions, organic contaminants in drinking water, and electromagnetic radiation. Because of the Agency's standard setting responsibilities, applicants are encouraged to design studies so that inferences may be made as to the level of exposure at which positive results were obtained, or if negative results occurred, statements can be made as to the confidence that positive results would have been observed if present.

2. Short-term tests and methods development and validation studies in the areas of toxic chemicals, air and water pollutants. Chronic disease effects (pulmonary, cardiovascular, cancer) are of particular interest. Included is pollutant identification, behavioral toxicologic effects, carcinogenic potential of chemicals, identification of exposure to pest control agents, and carcinogenic/mutagenic potency of short-term tests to potency in *in vivo* mammalian systems.

3. Experimental toxicologic studies related to exposures from air, water, electromagnetic radiation, and chemical substances. Behavioral aspects (including performance, learning and memory), neurophysiological effects, reproductive effects and immunologic studies are of particular interest.

For further information of a procedural nature please contact:

Dr. George R. Simon
U.S. Environmental Protection Agency
RD-675
401 M Street, S.W.
Washington, D.C. 20460
(202) 426-2355

Environmental Chemistry and Physics

The objective of this grant program is to develop the scientific tools and information generally needed to guide EPA and the states in making regulatory decisions. Of primary concern are methods for the identification of pollutants and the determination of the levels at which they occur, knowledge of the reactions of pollutants and their fates in the environment and the schema for predicting pollutant distributions given the location and strength of their sources. The program may be divided into two parts: (1) methods for identifying and measuring pollutants and (2) the transport, transformation and fate of pollutants in air, surface water, ground water and soils and sediments.

All grant applications in these areas will be considered. However, for fiscal year 1980, certain topics will be given emphasis. Those topics are:

1. Development of regional air quality simulation models with emphasis on predictions of ozone and fine particulate concentrations. Models and model components should be able to treat scales of motion from 100 to 1500 kilometers; reactive plume models for large point sources and maximum transport distances of approximately 150 kilometers. Emphasis should be placed on predictions of sulfates, nitrates and fine particulate concentrations.

2. Kinetics of conversion of SO_2 to SO_3 and of NO_x to nitrates; gas to particle conversion rates for pollutants in the photochemical complex, using chemical kinetic modeling techniques and parameterization techniques which can be used efficiently in large air quality simulation models.

3. Aerosol formation from aromatic hydrocarbons and high molecular weight olefines; atmospheric studies to discriminate among primary and secondary sources of carbon-containing aerosols. Such aerosols constitute a significant part of the particulate burdens in urban atmospheres.

4. Measurement methods for volatile and organic aerosols; continuous and personal monitoring devices for criteria and toxic pollutants in air; dynamics and kinematics of particles near sampling inlets as they relate to particulates collectors with an upper particle diameter cutoff of 15 micrometers. Development of novel measurement methods for estimating dry deposition of gases and fine particulates.

5. Abundance and fate of natural hydrocarbons and their influence on background levels of ozone. In particular, the development and exercise of photochemical models to establish the importance of natural hydrocarbons to the formation of ozone is sought.

6. Studies identifying the industrial and commercial sources of well-water contamination; models of the transport and fate of metals and other toxic chemicals in soils; methods to control nitrates from agricultural sources in ground water.

7. Transport models for priority pollutants from animal wastes into drinking water supplies; characterization of factors influencing abiotic degradation of toxic organic compounds in bottom sediments; microbial degradation rate constants of toxic organic compounds in natural water-sediment systems; behavior of toxic metals in natural water-sediment systems.

8. Improved techniques for multielement analysis of suspended sediments in water samples and in sludges; techniques for identification of non-volatile organic compounds in water samples; improved techniques for determination of chemical forms of priority toxic metals dissolved and suspended in ambient waters; rapid methods for determining the presence of toxic substances in air and water.

For further information of a procedural nature please contact:

Dr. Robert Papetti
U.S. Environmental Protection Agency
RD-675
401 M Street, S.W.
Washington, D.C. 20460
(202) 426-2355

Environmental Biology

The area of Environmental Biology, as related to EPA's research needs, involves the examination of ecological effects of pollutants. Quantification of specific effects on individual organisms is of interest, especially as related to interactions with ecosystems. An in-depth understanding of the principles involved in the fate and effects of pollutants on ecosystem processes is required to provide the Agency with the ability to anticipate, document, and predict environmental effects. Identification of theoretical principles, coupled with a basic understanding of critical

ecosystem processes which can be modeled (or scaled down) to permit demonstration of quantitative effects of pollutants, is required as a basis for developing predictive models.

Specific research areas include:

1. Contribution of Benthic Invertebrates to the Fate and Transport of Toxic Organics

The entry of toxic organics into food chains is dependent on the fate and transport of the toxicant itself. A fate process which could significantly affect fate assessments is the metabolism and transportation as mediated by benthic invertebrates. Deposit and detrital feeders process quantities of sediment material and their activity in sediment can both directly and indirectly affect the fate and transport of toxic organics in estuarine and coastal environments. Since toxic chemicals are absorbed to sediments, there is a need to establish the role of benthic invertebrates in the movement of these compounds in aquatic, estuarine and coastal systems.

A quantitative assessment of the role of benthic organisms in affecting the fate and transport of toxic organics is necessary to permit development of predictive models.

2. Bioaccumulation of Toxic Chemicals from Food by Aquatic and Estuarine Biota

A principal pathway for exposure of toxic organics to man is through estuarine food chains. Man's interest in harvesting parts of these food chains for food consumption represents a direct route of exposure for large parts of the population. The ability to predict the extent of exposure via this food chain mechanism depends in part on accurately estimating the transfer of a toxic chemical from one component of the food chain to another. Without this information, assessment of human exposure via common pathways in aquatic, estuarine, and marine environments cannot adequately be developed. Current information on estuarine chain processes indicates that exposure concentration, feeding rates, and food types are major factors in chemical transfer which must be further elucidated. These problems are similar to but *may* not be the same as those encountered in fresh water. Information adding to our understanding of these transfer processes is desired.

3. Great Lakes Studies

Studies conducted in the Great Lakes and smaller lakes

have documented phosphorous levels and levels of other organic and inorganic compounds. The data has been used to develop models describing the relationship between phosphorous levels and the trophic state of the Great Lakes. Additional data which:

(a) describes phosphorous-plankton relationships

(b) relates phosphorous input to available phosphorous and to observed levels

(c) relates phosphorous levels to trophic state

(d) extends the data base to include other significant organic and inorganic pollutants

is required to validate the models.

In addition, the contribution of airborne pollution to pollutant levels in the lakes must be better understood since this may be a major source of pollution affecting the food chain. Some available evidence indicates that this may be a significant source of PCB input to Lake Superior. Additional studies to aid in understanding the importance of this pathway for other organic and inorganic pollutants as well as PCB are needed.

4. Applied Genetics

The potential impact of new genones introduced (accidentally or deliberately) into established ecosystems as a consequence of large scale application of the technique of genetic manipulation is now known. Although the overall problem is very large and complex, involving interactions between a variety of biological systems, a possible sequence of events can be envisioned and the probability of occurrence of each step estimated. The probability of:

(a) *Introduction* into the environment (escape from containment)

(b) *Establishment* (surviving long enough to reach a non-hostile environment)

(c) *Dispersal* (dissemination into new sites or niches)

(d) *Impact* on populations, environments and ecosystem functions (emphasis on degree of reversibility and severity) can be determined.

Organisms of concern include both gram negative and positive genera, yeast, and viruses. Research efforts to

date have concentrated on *E coli* (K12 or 1776) and therefore this organism is being considered a model which can be modified for application to other genera. Thus, development, validation, and use of a multi-factorial model system for studying genomic impacts should be emphasized, including interaction with air, water, soil, and sewage.

While all four of the above facets of the problem are significant, initial emphasis will concern sections (a) and (b). Estimates of the probability of escape, and the probability of persistence, survival, and genetic exchange; during *transit* to and treatment in a sewage plant as well as the question of *Establishment* — i.e. determining if a niche exists which the novel organisms could occupy and the likelihood of this occurring and of this new environment affecting the organism are *required before examination* of *Dispersal* and *Impact* is possible. Proposals which treat any single aspect or combination of the above topics will be considered.

For further information of a procedural nature please contact:

Dr. Morris A. Levin
U.S. Environmental Protection Agency
RD-675
401 M Street, S.W.
Washington, D.C. 20460
(202) 426-2355